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Three New Australian Species of the Fish Genus *Xenisthmus* (Gobioidei: Xenisthmidae)

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ABSTRACT. *Xenisthmus chi* n.sp., described from two specimens from Rowley Shoals, Timor Sea, has in combination: second dorsal-fin rays I,12; anal-fin rays I,11; predorsal area with narrow median wedge of scales extending forward almost to pore D; posterior naris without flap; and head and body pale with brown reticulate mottling, forming about 11 X-shaped markings along sides between pectoral- and caudal-fin bases. *Xenisthmus eirospilus* n.sp., described from 15 specimens from throughout the southwest Pacific (type locality Elizabeth Reef, Tasman Sea), has in combination: second dorsal-fin rays I,12–13, usually I,12; anal-fin rays I,11–12, usually I,11; vertebrae 10 + 17; tongue indented; posterior naris with well-developed flap; upper sides of body with 12 large closely spaced spots, which usually do not extend to dorsal edge of body; and predorsal scaled to vertical through posterior edge of preopercle. *Xenisthmus semicinctus* n.sp., described from two specimens from Rowley Shoals, Timor Sea, has in combination: second dorsal-fin rays I,12; anal-fin rays I,11; vertebrae 10 + 17; tongue indented; posterior naris with well-developed flap; upper sides of body with 12 large, closely spaced spots, each connecting dorsally to, or almost to, mid-line by short, dark bar; and predorsal area with narrow median wedge of scales extending forward almost to pore D.

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Xenisthmus Snyder, 1908 (*Gignimentum* Whitley, 1933, *Luzoneleotris* Herre, 1938, *Platycephalops* Smith, 1957, and *Kraemericus* Schultz, 1966, are synonyms) is one of five genera that constitute the Indo-Pacific family Xenisthmidae, a well-corroborated, monophyletic group within the perciform suborder Gobioidei (Springer, 1983, 1988; Gill & Hoese, 1993). Species of the genus are distinguished from other xenisthmids by a single synapomorphy (third branchiostegal ray with an expanded proximal head), and in having the following combination of symplesiomorphies: first dorsal-fin with six spines; body scaled; and palatine teeth absent (Gill & Hoese, 1993). They are sand-diving fishes generally associated with sand patches adjacent to reef or rubble, particularly in surge areas.

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Xenisthmus includes only eight nominal species: *Eleotris polyzonatus* Klunzinger (1871), *Gignimentum penicillum* Whitley (1933), *Hetereleotris clara* Jordan & Seale (1906), *Kraemericus chapmani* Schultz (1966), *Luzoneleotris nasugbua* Herre (1938), *Xenisthmus africanus* Smith (1958), *X. balius* Gill & Randall (1994), and *X. proriger* Snyder (1908). Our ongoing studies indicate, however, that there are at least 10 additional undescribed species in the genus. We herein describe three such species, all of which have been collected from Australian waters.

Materials and methods

Measurements were made with dial calipers, recorded to the nearest 0.1 mm. All measurements to the snout tip were made to the mid-anterior tip of the upper lip. Standard length (SL) is the distance from the snout tip to the middle of the caudal-fin base, and is the body length used herein unless noted otherwise. Predorsal, preanal and prepelvic lengths are distances from the snout tip to the base of the anteriormost spine of the relevant fin. Head length is the distance from the snout tip to the dorsal edge of the gill opening. Head width is the broadest measurement between the posterior edges of the preopercles. Body width is the distance between the pectoral-fin bases. Snout length is over the shortest distance from the snout tip to the orbital rim. Orbit diameter is the horizontal width of the eyeball. Bony interorbital width is the least measurement. "Snout tip to retroarticular tip" is the distance from the snout tip to the posteriormost tip of the retroarticular bone. Caudal-peduncle length is the distance from the base of the posteriormost anal-fin ray to the ventral edge of the caudal peduncle at the vertical through the posterior edge of the lower hypural plate. Caudal-peduncle depth is the oblique distance between the bases of the posteriormost anal- and dorsal-fin rays. Pectoral-fin base depth is the vertical depth of the fleshy lobe. Pectoral-fin length is the length of the longest ray. Caudal-fin length is the length of the ventralmost ray on the upper hypural plate. Other measurements are self explanatory.

The last ray in the anal and second-dorsal fins is divided at its base and was counted as a single ray. "Scales in lateral series" was counted from the upper edge of the pectoral-fin base along the mid-side of the body to the posterior edge of the hypural plate. "Scales in forward transverse series" is the number of scales in the transverse series counted anterodorsally from the anal-fin origin. "Scales in backward transverse series" is the number of scales in the transverse series counted posterodorsally from the anal-fin origin. The pattern of interdigitation of first-dorsal-fin proximal pterygiophores between neural spines is given as a dorsal-fin pterygiophore formula following Birdsong *et al.* (1988). Gill-raker counts include all elements on the outer face of the first arch; the angle raker is included in the lower-limb (second) count. Letter codes for cephalic lateralis pores follow Akihito (1984; see also Gill & Randall, 1994: fig. 2). Specimens were temporarily stained with Cyanine Blue 5R to facilitate examination of small structures (Saruwatari *et al.*, 1997). Osteological details were determined from radiographs. Institutional codes follow Leviton *et al.* (1985).

Counts and morphometric values are presented first for the holotype, followed, where different, by value ranges or frequency distributions for paratypes. Frequency distributions are presented in the form "x fy", where "x" is the count and "f" indicates that the following value, "y", is its frequency. Where counts were recorded bilaterally from the holotype, both counts are given and separated from each other by a slash; the first count presented is the left count.

Xenisthmus chi n.sp.

Fig. 1

Xenisthmus sp. 2.—Allen & Russell, 1986: 100 (Rowley Shoals).

Type material. HOLOTYPE: WAM P.28030-033, 20.6 mm, male, Timor Sea, Rowley Shoals, Clerke Reef, 2 km south of Bedwell Island, 17°18'S 119°20'E, rotenone, G.R. Allen & R.C. Steene, 11 August 1983. PARATYPE: WAM P.28030-041, 22.0 mm, female, collected with holotype.

Diagnosis. A species of *Xenisthmus* with the following combination of characters: second dorsal-fin rays I,12; anal-fin rays I,11; predorsal area broadly scaled to just behind vertical through posterior edge of preopercle, with narrow median wedge of scales extending further forward almost to pore D; posterior naris without flap on anterior rim; and head and body pale with brown reticulate mottling, forming about 11 X-shaped markings along sides between pectoral- and caudal-fin bases.

Description. Dorsal-fin rays VI + I,12, all segmented rays branched; first dorsal-fin pterygiophore formula 3–13110; anal-fin rays I,11, all segmented rays branched; pectoral-fin rays 17/17, upper 1 (2) and lower 1 (2) ray(s) unbranched; pelvic-fin rays I,5, inner ray unbranched; segmented caudal-fin rays 9 + 8; branched caudal-fin rays 7 + 7; upper

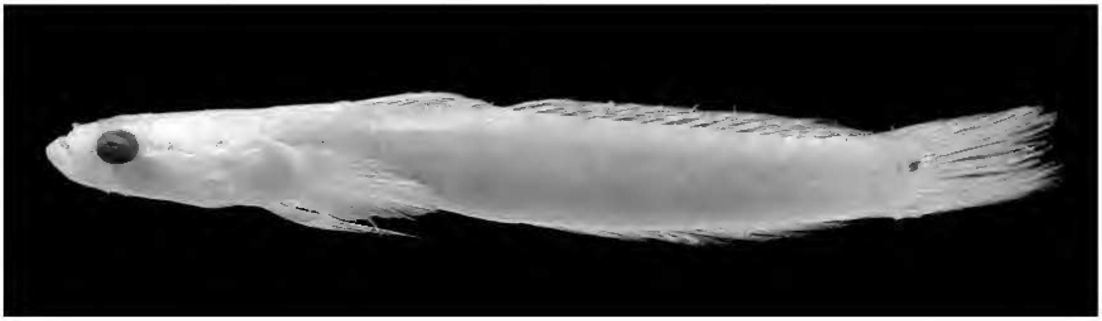

Fig. 1. *Xenisthmus chi*, holotype, WAM P.28030-033, 20.6 mm, male, Clerke Reef, Rowley Shoals, Timor Sea, Australia. (Photo by H. Taylor.)

unsegmented caudal-fin rays 7 (8); lower unsegmented caudal-fin rays 7 (8); total caudal-fin rays 31 (33); scales in lateral series 57/55 (52 f1; 54 f1); scales in forward transverse series 20/19 (17 f1; 18 f1); scales in backward transverse series 18/18 (16 f1; 19 f1); circumpeduncular scales 27 (26); predorsal scales 21 (18); cheek scales 4; gill-rakers 3 + 9 (2 + 9); pseudobranch filaments 4; vertebrae 10 + 16; epurals 2.

As thousandths of SL: head length 248 (241); predorsal length 340 (332); prepelvic length 238 (245); preanal length 515 (555); first dorsal-fin origin to second dorsal-fin origin 184 (182); second dorsal-fin base length 340 (355); anal-fin base length 306 (291); pectoral-fin base depth 73 (68); first dorsal-fin origin to pelvic-fin origin 170 (173); second dorsal-fin origin to anal-fin origin 141 (132); snout length 39 (45); orbit diameter 58 (55); head width 131 (145); body width 107 (109); bony interorbital width 15 (18); snout tip to retroarticular tip 97 (106); caudal-peduncle length 170 (168); caudal-peduncle depth 112 (114); length of first spine of first dorsal fin 92 (82); length of third spine of first dorsal fin 102 (100); length of sixth spine of first dorsal fin 63 (68); length of spine of second dorsal fin 87 (77); length of first segmented ray of second dorsal fin 117 (100); length of last segmented ray of second dorsal fin 121 (123); anal-fin spine length 73 (64); length of first segmented anal-fin ray 83 (95); length of last segmented anal-fin ray 131 (127); pectoral-fin length 209 (227); fourth segmented pelvic-fin ray length 189 (186); caudal-fin length 204 (209).

Body covered with small scales; scales cycloid on anterior and lower abdomen (in front of vertical through middle of abdomen), and narrowly along upper and ventral edges of body (adjacent to bases of dorsal and anal fins), remainder of body and caudal peduncle with ctenoid scales; ventral contour of abdomen fully scaled, except for narrow area beneath branchiostegal membranes; predorsal area broadly scaled to just behind vertical through posterior edge of preopercle, with narrow median wedge of scales extending farther forward almost to pore D; cheeks and upper part of operculum scaled; scales present on pectoral-fin base; narrow band of mostly ctenoid scales on fleshy portion of caudal-fin base; no scales on dorsal- or anal-fin bases.

Head pores A'BC D(S)EFHIJK' M'NOPQ'; lower lip fleshy and protruding, with uninterrupted, free ventral margin; anterior naris in short tube; posterior naris with raised rim, without prominent membranous flap anteriorly; tongue indented anteriorly; gill opening extending anteriorly to about midway between verticals through posterior edge of preopercle and posterior edge of eye.

Upper jaw with 2 or 3 (anteriorly) or 2 (posteriorly) rows of small, conical teeth, outer-row teeth largest and slightly curved; lower jaw with 3 (anteriorly) or 2 (posteriorly) rows of small, conical teeth, outer-row teeth largest and slightly curved; vomer, palatines and tongue edentate.

Preserved coloration. Head and body beige to pale brown with brown reticulate mottling (obvious when first examined in 1992, but now considerably faded); two short brown bars extending from eye, one from below mid-ventral part of orbital rim to just above posterior edge of maxilla, and one from posteroventral part of orbital rim to middle of cheek; upper part of pectoral-fin base with irregular dusky brown spot; second brown spot on middle part of pectoral-fin base (mostly concealed by gill membranes); brown mottling on body aligning to form about 11 X-shaped markings along sides between pectoral- and caudal-fin bases; first dorsal fin hyaline with irregular dusky brown spots basally, and prominent dark grey-brown spot posteriorly on distal part of fin behind sixth spine; second dorsal fin hyaline with two (anteriorly) or three (posteriorly) series of small brown spots arranged along length of each fin ray; caudal fin hyaline to beige with short dusky brown bar lining hypural edge near middle few caudal-fin rays; immediately behind bar, a dark grey-brown spot, overlying bases of lower three caudal-fin rays on upper hypural plate; remainder of caudal fin with three or four narrow wavy bars, best developed on upper part of fin; anal fin hyaline to beige; pectoral fins hyaline, with small, dark brown spot basally on upper third of fin; pelvic fins hyaline.

Live coloration. Not known.

Comparisons. *Xenisthmus chi* closely resembles *X. balius* in general coloration pattern and in lacking a flap on the posterior naris. It differs from that species in having fewer segmented dorsal- and anal-fin rays (12 and 11, respectively, versus 13 and 12–13, usually 12, in *X. balius*); a different first dorsal-fin pterygiophore pattern (3–13110 versus 3–22110); fewer scales in lateral series (52–57 versus 60–70); more extensive coverage of ctenoid scales on the body (body behind middle of abdomen with ctenoid scales versus at most only a few scattered ones on caudal peduncle); cheek and operculum scaled (versus naked); and predorsal scales with median series extending to near pore D (versus predorsal area broadly scaled to about vertical through posterior edge of preopercle).

Remarks. The specific epithet is a noun in apposition derived from the Greek letter (chi), and alludes to the X-shaped markings on the body.

Xenisthmus eirospilus n.sp.

Fig. 2

Xenisthmus n.sp.—Gill & Reader, 1992: 224 (Elizabeth and Middleton Reefs, Tasman Sea).

Type material. HOLOTYPE: AMS I.27149-041, 19.3 mm, female, Australia, Tasman Sea, NE slope of Elizabeth Reef, 29°54'S 159°02'48"E, 5–10 m, sand around base of coral patch reef, rotenone, A.C. Gill *et al.*, 10 December 1987. PARATYPES: AMS I.27134-034, 2: 16.0 mm, male, 21.2 mm, ♀, Australia, Tasman Sea, Middleton Reef, 29°27'12"S 159°06'48"E, 6–9 m, reef front, rotenone, A.C. Gill *et al.*, 4 December 1987; AMS I.33739-081, 2: 12.5–15.2 mm, juveniles, Australia, Coral Sea, NE side of Ashmore Reef, front reef slope, 6–9 m, FNQII party, 25 January 1993; BMNH 2003.1.22.9, 1: 14.1 mm, juvenile, collected with AMS I.33739-081; BPBM 39134, 12.0 mm, juvenile, American Samoa, north shore of Tutuila, west side of Tapisi Point, rocky shore with surge, vertical dropoff to 6 m, rotenone, J.E. Randall *et al.*, 9 May 1974; ROM 73524, 1: 14.5 mm, juvenile, 1: 19.5 mm, ♀, Fiji, Great Astrolabe Reef, 3.7 km east of Yanu-Yanu-i-Sau I., area on reef top around prominent "rock" just south of south side of Herald Pass, R. Winterbottom *et al.*, 5 April 1983; USNM 283132, 17.7 mm, juvenile, Fiji, south coast of Rotuma, east of Sumi,

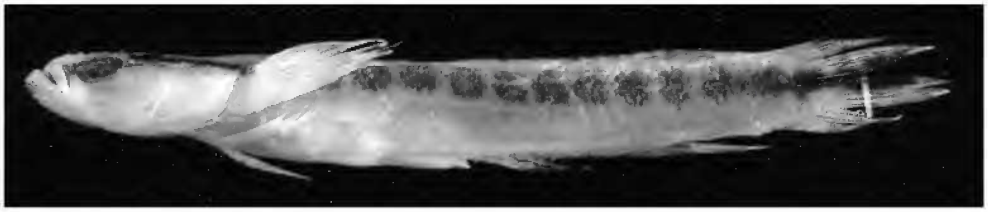

Fig. 2. *Xenisthmus eirospilus*, holotype, AMS I.27149-041, 19.3 mm, female, Elizabeth Reef, Tasman Sea, Australia. (Photo by P. Crabb.)

c. 12°30'S 177°05'E, 0–9 m, V.G. Springer *et al.*, 9 May 1986; USNM 338561, 4: 16.8–21.0 mm, ♀♀, Tonga, Vava'u Group, Hunga Island, eastern shore at small undercut cave in shore, 18°40'55"S 174°06'05"W, surge zone at rocky undercut, coral and rock bottom along surge channels, 0–5 m, J.T. Williams *et al.*, 25 October 1995; USNM 352587, 1: 18.2 mm, male, Solomon Islands, Santa Cruz Islands, Reef Islands, Lomlom Island, steep vertical wall at Nialo Point on east side of Forrest Passage, 10°16'S 166°18'30"E, vertical reef wall and rocky surge channels at surface, 0–35 m, rotenone and dipnets, J.T. Williams *et al.*, 18 September 1998.

Diagnosis. A species of *Xenisthmus* with the following combination of characters: second dorsal-fin rays I,12–13, usually I,12; anal-fin rays I,11–12, usually I,11; vertebrae 10 + 17; tongue indented; posterior naris with well-developed flap on anterior rim; upper sides of body with 12 large, closely spaced spots, which usually do not extend to dorsal edge of body; and predorsal area broadly scaled to about vertical through posterior edge of preopercle.

Description. Dorsal-fin rays VI + I,13 (I,12 f14); first dorsal-fin formula 3–22110; anal-fin rays I,11 (I,11 f13; I,12 f1); pectoral-fin rays 15/15 (15 f4; 16 f23; 17 f1), upper 1/1 (1–2) and lower 0/0 (0–3) rays unbranched; pelvic-fin rays I,5, inner ray unbranched; segmented caudal-fin rays 9 + 8; branched caudal-fin rays 8 + 7 (7–8 + 6–7 = 13–15); upper unsegmented caudal-fin rays 7 (5 f1; 7 f10; 8 f3); lower unsegmented caudal-fin rays 7 (5 f1; 6 f8; 7 f4; 8 f1); total caudal-fin rays 31 (27 f1; 30 f8; 31 f2; 32 f2; 33 f1); scales in lateral series 54/57 (50 f1; 51 f3; 52 f5; 53 f6; 54 f2; 55 f5; 56 f2; 57 f2; 58 f2); scales in forward transverse series 18/20 (17 f1; 18 f8; 19 f4; 20 f11; 21 f3; 22 f1); scales in backward transverse series 20/20 (16 f1; 17 f4; 18 f8; 19 f7; 20 f6; 21 f2); circumpeduncular scales 25 (24 f3; 25 f3; 26 f3; 27 f3; 28 f1); predorsal scales 17 (12 f1; 13 f4; 14 f5; 15 f3; 17 f1); cheek scales 3 (1–4); gill-rakers 2 + 8 (1–3 + 7–11 = 8–13); pseudobranch filaments 3 (3 f8; 4 f1); vertebrae 10 + 17; epurals 2.

As thousandths of SL (based on holotype and six paratypes, 15.2–21.0 mm): head length 249 (233–257); predorsal length 342 (324–355); prepelvic length 233 (224–241); preanal length 565 (531–566); first dorsal-fin origin to second dorsal-fin origin 192 (171–195); second dorsal-fin base length 332 (309–333); anal-fin base length 280 (274–303); pectoral-fin base depth 67 (62–75); first dorsal-fin origin to pelvic-fin origin 166 (152–178); second dorsal-fin origin to anal-fin origin 135 (126–143); snout length 41 (40–53); orbit diameter 62 (62–72); head width 124 (115–138); body width 109 (92–125); bony interorbital width 16 (14–20); snout tip to retroarticular tip 98 (90–105); caudal-peduncle length 171 (151–174); caudal-peduncle depth 104 (97–118); length of first spine of first dorsal fin 73 (69–95); length of third spine of first dorsal fin 88 (79–101); length of sixth spine of first dorsal fin 57 (52–71); length of spine of second dorsal fin 83 (72–101); length of first segmented ray of second dorsal fin 98 (87–107); length of last segmented ray of second dorsal fin? (broken in holotype, 87–126); anal-fin spine length 62 (57–77); length of first segmented anal-fin ray 83 (86–92); length of last segmented anal-fin ray 130 (79–131); pectoral-fin length 212 (174–217); fourth segmented pelvic-fin ray length 161 (154–185); caudal-fin length 218 (190–217).

Body covered with small scales; scales cycloid on anterior body, usually ctenoid on mid-side (more or less posterior to oblique line extending from posterior third of anal-fin base to anterior third of second dorsal-fin base) and caudal peduncle, although sometimes with mostly cycloid scales present and only few ctenoid scales on posterior body (mostly on caudal peduncle); ventral body contour fully scaled, except for narrow area beneath branchiostegal membranes; predorsal area broadly scaled to about vertical through posterior edge of preopercle; cheeks and upper part of operculum scaled; scales present on pectoral-fin base; narrow band of mostly ctenoid scales on fleshy portion of caudal-fin base; no scales on dorsal- or anal-fin bases.

Head pores A'BC D(S)EFHIJK' M'NOPQ' (head pores incompletely developed in 12.0 mm paratype); lower lip fleshy and protruding, with uninterrupted, free ventral margin; anterior naris in short tube; posterior naris with raised rim, with prominent membranous flap anteriorly; tongue indented anteriorly; gill opening extending anteriorly to about midway between verticals through posterior edge of preopercle and posterior edge of eye.

Upper jaw with 2–3 (anteriorly) or 2 (posteriorly) rows of small, conical teeth, outer-row teeth largest and slightly curved; lower jaw with 2–4 (anteriorly) or 2 (posteriorly) rows of small, conical teeth, outer-row teeth largest and slightly curved; vomer, palatines and tongue edentate.

Preserved coloration. Head and body beige to pale brown; short, narrow, dark grey-brown stripe extending from mid-anterior orbital rim to mid-side of upper lip; second dark grey-brown stripe extending from mid-posterior orbital rim to shoulder, overlapping upper part of pectoral-fin base; sides of body with 12 large (almost as large as eye diameter), dark brown to dark grey-brown spots, some of which may coalesce in some specimens (particularly final two on caudal peduncle); first spot just behind pectoral-fin base, second below first dorsal-fin origin, third below middle of first dorsal-fin base, fourth beneath and between dorsal fins, next six equally spaced beneath second dorsal-fin base, final two on caudal peduncle; posterior few spots on body and caudal peduncle sometimes connected to dorsal mid-line by short bars, or with irregular dorsal extensions to form saddles over caudal peduncle; first dorsal fin hyaline, usually with series of dark brown to dark grey-brown spots (one per fin ray) on distal third of fin; second dorsal fin hyaline with series of dark brown to dark grey-brown spots (one per fin ray) on distal third of fin, often with additional series of dark grey-brown spots on fin-ray bases; caudal fin hyaline with short dusky brown bar lining hypural edge near middle few caudal-fin rays; behind bar, a dark grey to grey-brown spot between lower three rays on upper hypural plate and upper ray on lower hypural plate; broad dusky brown to dark brown stripe extending from caudal-fin spot on to distal part of fin, often to distal tip of fin; remainder of caudal fin with several narrow wavy bars, usually best developed on upper part of fin; anal fin hyaline, sometimes with series of dark brown to grey-brown spots (one per fin ray) along distal third of fin; pectoral and pelvic fins hyaline to beige.

Live coloration. Not recorded in detail, although field notes (by J.E. Randall) accompanying BPBM 39134 say "white with a mid-lateral row of blackish dots".

Comparisons. *Xenisthmus eirospilus* belongs to a species complex characterized by the following combination of characters: upper sides of body with a series of large dark spots; second dorsal-fin rays usually I,12; anal-fin rays usually I,11; tongue indented; posterior naris with well-developed anterior flap; and vertebrae 10 + 17. *Xenisthmus semicinctus* is the only other described species in the complex. It differs from *X. eirospilus* in the following: predorsal scales with median series extending to near pore D (versus predorsal area broadly scaled to about vertical through posterior edge of preopercle); a median spot or short bar on the upper nape, just anterior to the vertical through the pectoral-fin base (versus nape without dark markings); no dark stripe extending from the bar or spot on the caudal-fin base (versus stripe present); and dark bands extending dorsally from the body blotches to the dorsal edge of the body (versus mostly without bands extending from dark blotches, although such bands occasionally present beneath posterior part of second dorsal fin). Additional, undescribed species in this complex are known from southern Japan, the Philippines and the Caroline Islands.

Remarks. The specific epithet is a noun in apposition derived from the Greek *eiro*, to join in lines or string together, and *spilos*, spot or fleck, and alludes to the prominent pattern of closely spaced dark spots on the mid-side.

Xenisthmus semicinctus n.sp.

Fig. 3

Xenisthmus sp. 1.—Allen & Russell, 1986: 100 (Rowley Shoals).

Type material. HOLOTYPE: WAM P.28025-048, 19.4 mm, male, Timor Sea, Rowley Shoals, Clerke Reef, lagoon, 1.5 km south of Bedwell Island, 17°18'S 119°22'E, 1–2 m, rotenone, G.R. Allen & R.C. Steene, 6 August 1983. PARATYPE: WAM P.28025-068, 18.0 mm, presumptive male, collected with holotype.

Diagnosis. A species of *Xenisthmus* with the following combination of characters: second dorsal-fin rays I,12; anal-fin rays I,11; vertebrae 10 + 17; tongue indented; posterior naris with well-developed flap on anterior rim; upper sides of body with 12 large, closely spaced spots, each connecting dorsally to, or almost to, mid-line by short, brown to dark brown bar; and predorsal area broadly scaled to just behind vertical through posterior edge of preopercle, with narrow median wedge of scales extending further forward almost to pore D.

Description. Dorsal-fin rays VI + I,12, all segmented rays branched; first dorsal-fin pterygiophore formula 3–22110; anal-fin rays I,11, all segmented rays branched; pectoral-fin rays 16/16 (15 f2), upper 1/1 and lower 1/1 (0 f2) rays unbranched; pelvic-fin rays I,5, inner ray unbranched; segmented caudal-fin rays 9 + 8; branched caudal-fin rays 8 + 7; upper unsegmented caudal-fin rays 7; lower unsegmented caudal-fin rays 7 (6); total caudal-fin rays 31 (30); scales in lateral series 55/60 (58 f2); scales in forward transverse series 19/21 (19 f1; 20 f1); scales in backward transverse series 19/21 (17 f1; 19 f1); circumpeduncular scales 28 (27); predorsal scales 21 (20); cheek scales 4; gill-rakers 3 + 10 (2 + 9); pseudobranch filaments 3; vertebrae 10 + 17; epurals 2.

As thousandths of SL: head length 242 (244); predorsal length 324 (339); prepelvic length 237 (233); preanal length 485 (533); first dorsal-fin origin to second dorsal-fin origin 180 (189); second dorsal-fin base length 335 (322); anal-fin base length 294 (289); pectoral-fin base depth 72 (67); first dorsal-fin origin to pelvic-fin origin 160 (172); second dorsal-fin origin to anal-fin origin 144 (150); snout length 41 (38); orbit diameter 62 (61); head width 160 (133); body width 113 (111); bony interorbital width 15 (11); snout tip to retroarticular tip 113 (111); caudal-peduncle length 175 (183); caudal-peduncle depth 113 (111); length of first spine of first dorsal fin 67 (83); length of third spine of first dorsal

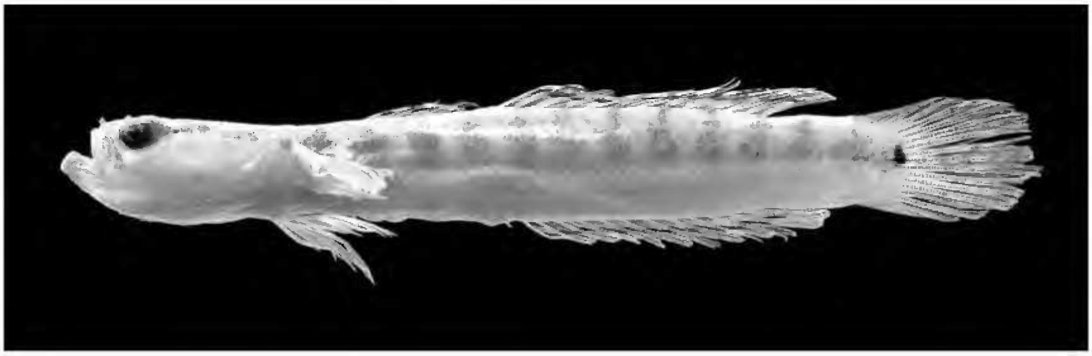

Fig. 3. *Xenisthmus semicinctus*, holotype, WAM P.28025-048, 19.4 mm, male, Clerke Reef, Rowley Shoals, Timor Sea, Australia. (Photo by H. Taylor.)

fin 82 (83); length of sixth spine of first dorsal fin 57 (67); length of spine of second dorsal fin 77 (83); length of first segmented ray of second dorsal fin 98 (94); length of last segmented ray of second dorsal fin 113 (111); anal-fin spine length 62 (67); length of first segmented anal-fin ray 88 (89); length of last segmented anal-fin ray 129 (106); pectoral-fin length 206 (211); fourth segmented pelvic-fin ray length 175 (178); caudal-fin length 201 (211).

Body covered with small scales; scales cycloid on anterior body, ctenoid on mid-side (behind vertical through middle of anal-fin base) and caudal peduncle; ventral contour of body fully scaled, except for narrow area beneath branchiostegal membranes; predorsal broadly scaled to just behind vertical through posterior edge of preopercle, with narrow median wedge of scales extending further forward almost to pore D; cheeks and upper part of operculum scaled; scales present on pectoral-fin base; narrow band of mostly ctenoid scales on fleshy portion of caudal-fin base; no scales on dorsal- or anal-fin bases.

Head pores A'BC D(S)EFHIJK' M'NOPQ'; lower lip fleshy and protruding, with uninterrupted, free ventral margin; anterior naris in short tube; posterior naris with raised rim, with prominent membranous flap anteriorly; tongue indented anteriorly; gill opening extending anteriorly to about midway between verticals through posterior edge of preopercle and posterior edge of eye.

Upper jaw with 3 (anteriorly) or 2 (posteriorly) rows of small, conical teeth, outer-row teeth larger and slightly curved; lower jaw with 3 (anteriorly) or 2 (posteriorly) rows of small, conical teeth, outer-row teeth larger and slightly curved; vomer, palatines and tongue edentate.

Preserved coloration. Head and body beige to pale brown; short, narrow, dark grey-brown stripe extending from mid-anterior orbital rim to mid-side of upper lip; second dark grey-brown stripe extending from mid-posterior orbital rim to shoulder, overlapping upper part of pectoral-fin base; median spot or short bar on upper nape, just anterior to vertical through pectoral-fin base; sides of body with 12 large, dark brown spots, each connecting dorsally to, or almost to, mid-line by short, brown to dark brown bar; first bar and spot just behind pectoral-fin base, second at first dorsal-fin origin, third through middle of first dorsal-fin base, fourth between dorsal fins, next six equally spaced along second dorsal-fin base, final two on caudal peduncle; dorsal fins hyaline with narrow, dark grey-brown stripe along distal third of fins, and series of dark grey-brown spots at base of fins (aligning with bars on body); caudal fin hyaline with short, dark grey to grey-brown bar or spot between third lowest ray on upper hypural plate and upper ray on lower hypural plate, just posterior to their basal tips; bar or spot edged anteriorly with brown to dark brown; remainder of caudal fin with three or four narrow, wavy bars, best developed on upper part of fin; anal fin hyaline with narrow dark grey-brown stripe along distal third of fin; pectoral and pelvic fins hyaline to beige.

Live coloration. Not known.

Comparisons. See Comparisons for *X. eirospilus*.

Remarks. The specific epithet, here treated as a noun in apposition, is derived from the Latin *semis*, meaning half, and *cinctum*, meaning girdle or belt, and alludes to the dark markings on the dorsal part of the body.

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